

## **REMARKS**

The present Amendment is provided in response to the Official Action mailed November 28, 2003.

### **The IDS**

Applicants submit concurrently herewith an Information Disclosure Statement (IDS) of materials from the corresponding PCT application. Applicants request that these materials be considered and an initialed copy of the PTO-1449 form be returned.

### **The Objection to the Drawings**

The Official Action objects to Figures 1, 2A and 2B. Applicants have amended Figures 1, 2A and 2B to reflect that the figures refer to prior art. Substitute drawing sheets are provided herewith reflecting such a change. Applicants submit that such amendments overcome the objection to the drawings.

### **The Objection to the Specification**

The Official Action objects to the specification because ERD is not defined. Applicants have amended the specification to clarify that ERD refers to entity relationship diagram. Applicants submit that such amendment overcomes the objection to the specification.

### **The § 101 Rejection**

Claims 1 and 36 stand rejected under 35 U.S.C. § 101 as directed to non-statutory subject matter. While Applicants submit that the claims as originally filed are directed to statutory subject matter, Applicants have amended Claims 1 and 36 to clarify that the actions are carried out in a database. Thus, Applicants submit that Claims 1 and 36 are not directed to an abstract idea but are directed to specific operations/structures that are implemented in a database. Accordingly, Applicants submit that Claims 1 and 36 are directed to statutory subject matter.

### **The § 112 Rejections**

Claims 1-11 and 36-39 stand rejected under 35 U.S.C. § 112, first paragraph as failing to comply with the enablement requirement. In particular, The Official Action states that, with regard to Claim 1, the application "fails to disclose the mechanism as to how to use the claimed foreign key to enforce the claimed multiple but exclusive relationships between tables in a relational database." Official Action, p. 5. With regard to Claim 36, the Official Action asserts that "Applicant fails to teach the technique being used for associating a type with records in the first table and the set of second records." Official Action, p. 5. The Official Action further asserts that "Applicant fails to show any link of enforcing a multiple but exclusive relationship between a plurality of tables via associating a type with the records of these tables." Official Action, p. 5.

With regard to Claim 1, the specification of the present application describes in detail how the multiple but exclusive relationship is provided. As recited in Claim 1, the multiple but exclusive relationship is provided by selectively associating a foreign key associated with a record in a relating table with a specific one of a plurality of related tables based on at least one attribute of the record in the relating table. Claim 1 does not recite that the relationship is enforced but recites that it is provided. For example, Figures 5A, 5B, 6A and 6B illustrate database schemas that provide for a multiple but exclusive relationship. For example, as discussed in the present specification at page 10, line 15:

**Figure 4A** will now be described with reference to **Figure 5A** which is an ERD illustrating embodiments of the present invention for a one-to-many multiple but exclusive relationship. As seen in **Figure 4A**, a first table has defined a type, which may be one or more columns of the first table, which identifies to which of multiple possible second tables a foreign key of a record in one and only one of the possible second tables points (block 420). For example, in **Figure 5A**, each of tables  $B_1, B_2, B_3, \dots, B_m$  have foreign key *af* that points to a record in Table A. A type is defined in Table A which identifies which of the tables  $B_1, B_2, B_3, \dots, B_m$  the record is associated with.

Thus, in the example in **Figure 5A**, the foreign key in tables  $B_1, B_2, B_3, \dots, B_m$  correspond to the foreign key of Claim 1 and point to a record in the relating table (Table A). The type defined in the record in Table A identifies which of the tables  $B_1, B_2, B_3, \dots, B_m$  is associated with the record. Thus, the type may be the attribute of the

record that selectively associates the foreign key with the record Table A.

Accordingly, records in Table A may

The enforcement of this relationship may be provided, for example, as described with reference to Figures 4A-4D. For example, in discussing Figure 4A, the specification beginning at page 10, line 24 states:

As is further seen in **Figure 4A**, the DBMS may enforce the multiple but exclusive relationship between Table A and the tables  $B_1, B_2, B_3, \dots, B_m$  by enforcing the relationship when a record in one of the  $B_1, B_2, B_3, \dots, B_m$  is created or modified such that a record in the first table is accessed (block 422) and the type associated with the record evaluated (block 424). If the type of the record in the first table matches the one of the second tables in which the record which has a foreign key which points to the record in the first table is being modified or created (block 426), the entry in the second table is allowed by the DBMS 120 (block 428). If the type of the record in the first table does not match the one of the second tables in which the record which has a foreign key which points to the record in the first table is being created or modified (block 426), the entry in the second table is not allowed by the DBMS 120 (block 430). Thus, the type is used to enforce the relationship between records in Table A and corresponding records in the tables of  $B_1, B_2, B_3, \dots, B_m$  such that foreign key values *af* in the tables of  $B_1, B_2, B_3, \dots, B_m$  are only associated with records in Table A having a type which corresponds to the particular one of the tables  $B_1, B_2, B_3, \dots, B_m$  of a given record. Thus, in **Figure 5A**, for the one-to-many relationship the first table may be an entity table and the plurality of second tables may be a plurality of entity tables having a one-to-many relationship enforced by the type values of records in the first table.

Other embodiments of the present invention are described with reference to Figures 4B, 4C and 4D and Figures 5B, 6A and 6B. Applicants submit that the discussion at least on pages 9 through 14 describes how the foreign key may be selectively associated with a record in a table so as to provide the multiple but exclusive relationship. As such, Applicants submit that Claim 1 is enabled by the specification and, therefore, request withdrawal of the present rejection.

With regard to Claim 36, the specification clearly states that the type may be associated with predefined table types or may be configurable, for example, such that new table types may be added. *See e.g.*, Specification, p. 9, line 33 to p. 10, line 7. As is further discussed in the specification, in certain embodiments of the present invention, the type may be a column or columns in a table that identify which of multiple possible second tables a record points. *See e.g.*, Specification, p. 10, lines

17-20. In certain embodiments, foreign keys of the second table points to the record in the first table. For example, the record in the first table is only associated with records in a second table if the type in the record in the first table corresponds to the type of the second table. *See e.g.*, Figure 4A. Thus, Applicants submit that the present specification does teach how the records in the first table are associated with records in the second table.

Furthermore, the specification also describes in detail how a multiple but exclusive relationship between a plurality of tables via may be enforced by associating a type with the records of these tables. In fact, the flowcharts of Figures 4A-4D and the corresponding discussion in the specification provide just such a description. As such, Applicants submit that Claim 36 is enabled by the present specification.

Claims 36-48 are also rejected under 35 U.S.C. § 112, second paragraph as being indefinite. In particular, the Official Action asserts that it is not understood what "associating a type with respective ones of the plurality of second tables means?". Applicants fail to understand what is unclear about this recitation. To answer the specific questions in the rejection, respective ones of the plurality of second tables refers to just that, respective ones of the plurality of second tables. Nothing is unclear or indefinite about this recitation.

Applicants do not understand the question "[w]hat type is used to associate the claimed respective ones of a plurality of second tables?". The type associated with any particular second table is arbitrary within a database schema other than that it identify a particular one of the second tables. Thus, for example, the "typename" described at page 11, lines 9-26 may be an arbitrary identification as long as it is associated with a particular one of the tables  $B_1, B_2, B_3, \dots B_m$ .

Finally, Applicants do not limit the inventions of Claims 36, 40 and 45 to any particular mechanism for identifying the second tables as long as the type of the table is associated with a particular one of the second tables. As such, Claims 36, 40 and 45 are not indefinite for failing to specify, for example, whether a look-up table, such as Table T, is used or the identification is directly in the first table. Accordingly, Applicants request withdrawal of the rejection of Claims 36-48.

**The § 102 Rejection**

Claims 1-48 stand rejected as anticipated under 35 U.S.C. § 102 by United States Patent No. 5,933,831 to Jorgensen (hereinafter "Jorgensen"). The Official Action cites to Figures 3A-3C of Jorgensen as disclosing "means for selectively associating a foreign key value of a record in the relating table with a specific one of the plurality of related tables based on at least one attribute of the record containing the foreign key in the relating table." Official Action, p. 8. However, the cited figures of Jorgensen describe operations for displaying a hyperlinked entity relationship diagram. Jorgensen, col. 2, lines 52-55. The operations of Figures 3A-3C do not provide the entity relationship in a database but merely provide a display of that relationship. Nothing in the cited portions of Jorgensen discloses or suggests the selective association of a foreign key in a relating table with a specific one of a plurality of related tables based on an attribute of the record containing the foreign key in the relating table as is recited in independent Claim 12. Similar recitations to those of Claim 12 are found in Claims 1 and 24. Accordingly, these claims are also not anticipated by Jorgensen for analogous reasons.

While the Official Action mentions Claim 40, the Official Action never explains how the recitations of Claim 40 are disclosed by Jorgensen. Claim 40 recites:

40. (Original) A system for enforcing a multiple but exclusive relationship between a first table and a plurality of second tables, comprising:  
means for associating a type with respective ones of the plurality of second tables;  
means for associating a type with records in the first table such that the type of a record in the first table identifies which of the respective ones of the plurality of second tables the record is associated with; and  
means for enforcing the multiple but exclusive relationship between records in the second tables and the first table based on the type associated with a record in the first table.

Applicants submit that a system for viewing entity relationship diagrams as described in Jorgensen does not disclose or suggest enforcing multiple but exclusive relationships between records as recited in Claim 40. Accordingly, Applicants submit that Claim 40 and the claims that depend from Claim 40 are neither disclosed nor suggested by Jorgensen. Similar recitations are found in Claims 36 and 45 and,

therefore, these claims and the claims that depend from them are patentable over Jorgensen for analogous reasons.

With regard to the dependent claims, these claims are patentable as depending from a patentable base claim. However, Applicants submit that certain of these claims are separately patentable over the cited references. The Official Action rejects the dependent claims saying that they are "default properties of OO SQL processing." Official Action, p. 8. Applicants are not claiming new properties of SQL but are claiming the use of database techniques to provide new functionality. Based on the logic of the argument in the Official Action no software implemented invention is patentable if the programming language it is written in is known. Applicants submit that merely because the building blocks that are used to create embodiments of the present invention are known, that does not disclose or suggest the specific arrangement of those building blocks as is recited in the claims.

For example, Claim 17 recites:

17. (Original) The database system of Claim 12, wherein the relating table comprises a third table, the related tables comprise a plurality of second tables and wherein the third table relates records in a first entity table to records in a corresponding one of the second tables and wherein the means for selectively associating comprises:  
means for defining a foreign key of records of the third table;  
means for defining a plurality of types of foreign key associations, each of the types corresponding to a respective one of the plurality of second tables;  
means for selecting one of the second tables having a type corresponding to a type value associated with a record of the third table; and  
means for identifying a record in the selected second table based on a foreign key value of the foreign key of the record in the third table.

Claim 17 is not merely the recitation of standard SQL processing but is a specific configuration for a database system that includes, for example, a third table that relates records in the first entity table to records in a corresponding one of the second tables. Additional recitations of Claim 17 are not merely default properties of SQL but recite specific configurations of a database and operations performed by the database. As such, Applicants submit that Claim 17 is separately patentable over Jorgensen for at least these additional reasons. Analogous arguments may be made for other of the dependent claims.

Claims 15, 19 and 43 recite that the multiple but exclusive relationship is enforced by a database trigger. The Official Action cites to Figure 3C of Jorgensen as disclosing the recitations of these claims. Official Action, p. 8. However, Figure 3C of Jorgensen merely describes displaying trigger information if a user clicks on an icon indicating that there is trigger information to be displayed. Jorgensen, Figure 3C. There is no indication in the cited portion of Jorgensen what function the trigger would perform and, in fact, there is not even a use of a trigger but merely the display of information associated with a trigger. As such, Applicants submit that Claims 15, 19 and 43 are separately patentable over the cited portions of Jorgensen for at least these additional reasons.

Claim 16 recites:

16. (Original) The database system of Claim 14, wherein the means for selectively associating comprises:  
means for defining a type associated with respective ones of the plurality of related tables in a type table;  
means for accessing the type table to determine a type associated with a record in the relating table based on a value in the record in the relating table which identifies a record in the type table which identifies a type; and  
means for associating the type identified in the type table with the record in the relating table so as to select one of the plurality of related tables which contain records having foreign key associations which point the record in the relating table.

Applicants submit that the recitations of Claim 16 are not disclosed or suggested by the hyperlinks of Jorgensen. For example, the hyperlinks of Jorgensen are used to display information about tables in a database. They are not used for accessing records in the tables themselves. Thus, Applicants submit that the recitations of Claim 16 regarding accessing the type table to determine a type associated with a record in the relating table based on a value in the record is neither disclosed nor suggested by the hyperlinks of Jorgensen. Accordingly, Applicants submit that Claim 16 is separately patentable over the cited references for at least these additional reasons.

### **Conclusion**

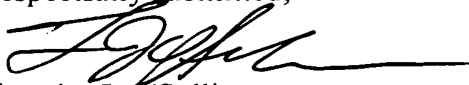
In light of the above discussion, Applicant submits that the present application is in condition for allowance, which action is respectfully requested. If, in the opinion

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of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (919) 854-1400.

It is not believed that an extension of time and/or additional fee(s)-including fees for net addition of claims-are required, beyond those that may otherwise be provided for in documents accompanying this paper. In the event, however, that an extension of time is necessary to allow consideration of this paper, such an extension is hereby petitioned for under 37 C.F.R. §1.136(a). Any additional fees believed to be due in connection with this paper may be charged to Deposit Account No. 50-0220.

Respectfully submitted,



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**CERTIFICATE OF MAILING**

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop Non-Fee Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on February 25, 2004.



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